Challenges of Building Africa's Innovation Systems

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By Mammo Muchie, SARCHi, IERI, TUT, South Africa and Aalborg University, Denmark, Senior Research Associate, SLPTM< Oxford University,UK

Overview

- Inspiration
- Reality Check on Africa!
- Clarity on innovation?
- Making Systems of Innovation?
- Problems of Building Innovation Systems
- System of Innovation Actors
- National System of Innovation Problems in Making African innovation Systems
- CIS-Community System of Innovation
- Knowldge Indicators & Concluding Remark

Inspiration!

- ”There is no presumption that the system (of innovation-MM) was, in some sense, consciously designed, or even that the set of institutions involved work together smoothly and coherently.” (Nelson & Rosenberg, in National Innovation System : A Comparative Analyis, Oxford University Press, Oxford 1993:4)

Inspiration!

- ”At present nations seem to be conscious as never before of their ’innovation systems’ and how they differ from those of their peers… it is leading to attempts on the part of nations to adopt aspects of other systems that they see as lending strength.” (Nelson, ibid. 520)

Reality check on Africa?

- About 70% of the African population lives on less than US$ 2 a day
- 35 of the world's 50 least developed countries are reported to be on the African continent
- Population without access to electricity:
- Sub-Saharan Africa: ca. 75%
- China: ca. 1.5%
- About 40% of the African population has no access to safe and clean drinking water
- About 50% of the African population lives in poor sanitation conditions

Clarity on what Innovation is?

- Innovation comes in a variety of forms
- It seems to be used often by different people to mean different things
- Making sense of its use is necessary to know how we go about using it with a shared sense-making of its salient meaning.

Clarification

- Two senses of its use are relevant… use and application as product, process and service
- And degree of novelty associated with innovation:
- incremental ..Immprovements not changes
- radical…Changes calling for a whole new architecture, not a modification of it
- Modular.. Using an existing system of a product while employing new or different components
- Architectural. A reconfiguration of an established system to link together existing components in a new way

Clarification

- Innovations are not homegenous
- Innovations vary
- Finding out what precisely is being innovated is important
- Need to be critical of what we mean by innovative
- Responses to different types of innovation by those in competition will differ
- Creative destruction will affect the destroyed but will be good news to the new entrants ready to capitalise on the created.

Not made in a vacuum

- Innovation does not occur in a vacuum
- Concept/definition/framing matters
- Theory Matters
- History matters
- Path dependency matters
- Context matters
- Institution matters
- Environment matters
- Culture matters

Making Innovation systems

- All innovation systems have elements, components, parts
- All innovation systems have activities and perform functions with varying degrees of effectiveness
- All innovation systems have linkages, interconnections and interactions
- All innovation systems have boundaries (spatial, sectoral, technological, etc)

Key System of innovation elements?

- Conceptual frame and ideas of governing
- Policy setting
- Actors
- Specific unit for system generation (e.g., national, sectoral, regional, community and so on)
- Activities
- Institutions
- Knowledge
- Incentives

System of innovation building

- Are the included or selected elements specifically related to innovation creation, absorption, transfer and adaptation or not?
- Does the interaction facilitate certain outcomes and hinder others?
- Does the interaction lock in the system of innovation to certain paths of development?
- How and who facilitates system openess?
- How can the system building prevent locking out potential paths of development that may come from outside the system?
- For example, the opportunity to harness broad-based innovation by lock out!

Analytically selecting a System boundary?

- Boundaries range spatially from local to city, community, region, national and global- where to draw the boundary? Who to include and who to exclude?
- Boundaries if related to production: (e.g., industry, firms, sectors, global firms)
- Boundaries if related to technology: high tech, low tech and intermediate
- Boundaries within a country or nation: urban and rural, industrial and agricultural, high- tech, medium-tech, low-tech, technology absorbing or technology generating and so on
- Boundaries can be narrow to exclude or broader to include!
- Boundaries are not necessarily fixed, they can be flexible and amenable to intelligent adjustment!

Emergent Systems of Innovation

- If the interaction within the given boundary becomes strong and sustainable, a functioning system is said to emerge
- If the interaction is weak, a non-functioning system of innovation can occur
- If the interaction is neither strong or nor weak, a relatively functioning system may emerge

Explaining Variation in Systems of Innovation

- The degree of functioning of a system of innovation is not only dependent on the quality and strength of interactions
- It also dependes on the quality of the actors interaction
- The politics of the actors , and the politics governing the nature of their interaction
- The expected outcome can be any goal set such as economic development, growth, social cohesion, knowledge production
- But the way the politics of system building plays out heavily influences the output and outcome

System of Innovation Actors

- The system of innovation key actors differ in their capabilities, efficiences, commitment and policy creation and execution
- Universities differ
- Industries differ
- Governments differ
- They differ in the quality of what they produce and their interaction
- Some interactions produce results and outputs
- Others interact but produce little or no output.

Evaluating System of Innovation Actors

- Key actor interaction:
- On the input side: are the actors well organised, do they have visions and missions to assist the vision and mission of the nation
- Do they have resources
- Do they have human capital and concentration of talent
- Do they have trust and dilaogue capital

On the Output Side

- Does the interaction of actors enhance:
- more and the build up of capacity, capability, competence
- Does the interaction permit science , technology and innovation to enhance wealth creation
- Is the interaction productive or destructive?
- Is the output effective or ineffective?
- Is the output sustainable or one or short term?

Variation in input and output

- Developing countries have problems in assembling the input side
- Hence problems in generating predicatable developmental output
- Poorer countries depend very much on outside input
- This distorts their policy vision and a well-functioning system generating potential
- Often distorts that vision
- Leading to states of entangled complexity

Transition Countries

- The transion countries have features of system of innovation actor interactions that has a bifurcated developing and developed country features
- The challenge is to shed the developing country feature to make it a developed
- All the more to get their systems of innovation to evolve and develop.

Developed countries

- They have established systems of innovations
- They have universities
- They have industries
- They have goverments (national and local)
- The se system of innovation actors , however the variations within, span a broadly well functioning system of innovation

National Innovation System

- An ability by a nation to mobilise and use resources, deploy institutions, put in place incentives and regulations, carry out favourite experiments
- Why some countries are better at innovation than others?
- National culture that foster innovation matters
- Relevant to and affects attitude to work, time
- Use of authority
- Styles of decision-making
- Balancing contradictory claims
- Equality, legitmacy issues can influence innovative behaviour

National Innovation System Vary

- in Africa, they have to be made; a need to launch an African innovation movement
- The unit for making them is a matter of debate: cities and wealth creation; linking rural with city economy; the region, continent and so on
- Where a national system exists like South Africa, it is radically bifurcated: need to combine its link with the challenge of linking ZA's NSI with the rest of Africa
- See our conceptualisation in our book: Bridging Digitial Divide: Innovation Systems for ICT

The Making of African Innovation Systems

- Stimulate and understand inter economic and non-economic actor interactions and dynamics,
- Co-evoution of economic and non-economic governing institutions, practices and understanding (Richard Nelson)
- The interaction of policies, knowledge, incentives, instuitions, practices and the understanding involved in the process
- System building, to identify significant interactions and interfacing of parts,
- Bridge the gap between theory and reality,
- The sources and organisation for stimulating innovation, imagination and creativity, learning and comptence building
- To understand how routines are formed and novelties emerge and prepare and design policy frames!

Making African NSI

- Integrating Africa or making the Africa nation itself is a problem of dynamic innovation systems, of creative destruction,requiring systemic approaches to understanding and creating knowledge in interaction with policies, instituitions, system of innovation actors, incentives
- Innovation systems are useful to assist in stimulating how an African unity can be forged!
- Africa's Greatest Day Is its unity: Will building Innovation System help?

Why an African NSI?

- A national system of innovation to promote a national system of production
- To enable a system creation to produce what Africa consumes, and to consume what Africa produces
- To create Africa…wide producers and users interactions (Lundvall:85)
- To embed knowledge creation,innovation, learning in Africa's institutions,societies
- To inject a total learning and innovation culture in Africa
- To retain African resources to stimulate African development

The options

- To try to build the NSI of existing states as they are–
- Use regional integration..
- AU/NEPAD processes
- Role of Pivotal States like South Africa
- Top-Up: Africa wide project
- Bottom up: Community System of Innovation

The Neglected: Community and African Unity

- The Community level activities are ignored, unknown or neglected
- The Africa-wide level project is often misused, misconstrued and even abused
- Explore what the community level knowledge building may take place
- From exploration, process, exploitation and impact
- To build ' Africa's smart growth 'by linking bottom up with the broader African unification project
- Next I will only deal with the Community System of innovation

Community System of Innovation

- To date the most popularised system of innnovation is the National Level, for Africa it means the existing states as they are!
- The issues for policy have been framed with technology or innovation catch up and development
- The relevant instituitions are those that create knowlege , R & D, absorb knowledge etc..
- The main actors often selected are: industry-university-Government interactions

Innovation at the Community level

- Need to centre or anchor the innovation system to the community level
- Establish a Community Innovation System (CIS) to promote development from the bottom, not just from the state and business.
- Redifine community level elements
- Broaden the boundary to include the community as part of the interaction of Government, industry, university and other relevant actors
- Redifine institutions, incentives, regulations and policy to accommodate community level knowing for creating grassroots innovation!

Definition: Community Innovation System

- An ability by a community to mobilise and use resources, organise knowledge and human capital training, deploy institutions, put in place incentives and regulations, to carry out the favourite experiments, activities and functions undertaken by citizens by converting their tacit and explicit knowledge into innovations.
- The active engagement and support by Governments, industries, universities and other actors in and with the community's efforts to create and transform existing knowledge into innovation by identifying and applying the knowledge converted into innovations to address social and environmental challenges at the grassroots level.
- Governments support through constructive policy, universities by providing top research to identify the knowledge that exists at the community level and industry by helping in the process of conversion of the community knowledge into innovation, and the community is empowered to use the knowledge inside to create innovation and wealth!

Innovative thinking needed?

- Meanwhile as the policy pundits keep peddling competiveness and other aspirations to reach industrial status
- Many people in the rural areas and the urban townships suffer
- Life is static and often essential services for well being are unavailabe or if they exist are mostly inadequate!
- There is a need to think differently- out of the box of linear progress into co-evolution through the concept of the Community System of Innovation
- Try to address the problems of those who live in the rural areas now rather than later after the completion of tha manufacturing stage.(when this will take placen is still unknown or is hard to predict?)

From linear Progress to Co-evolution?

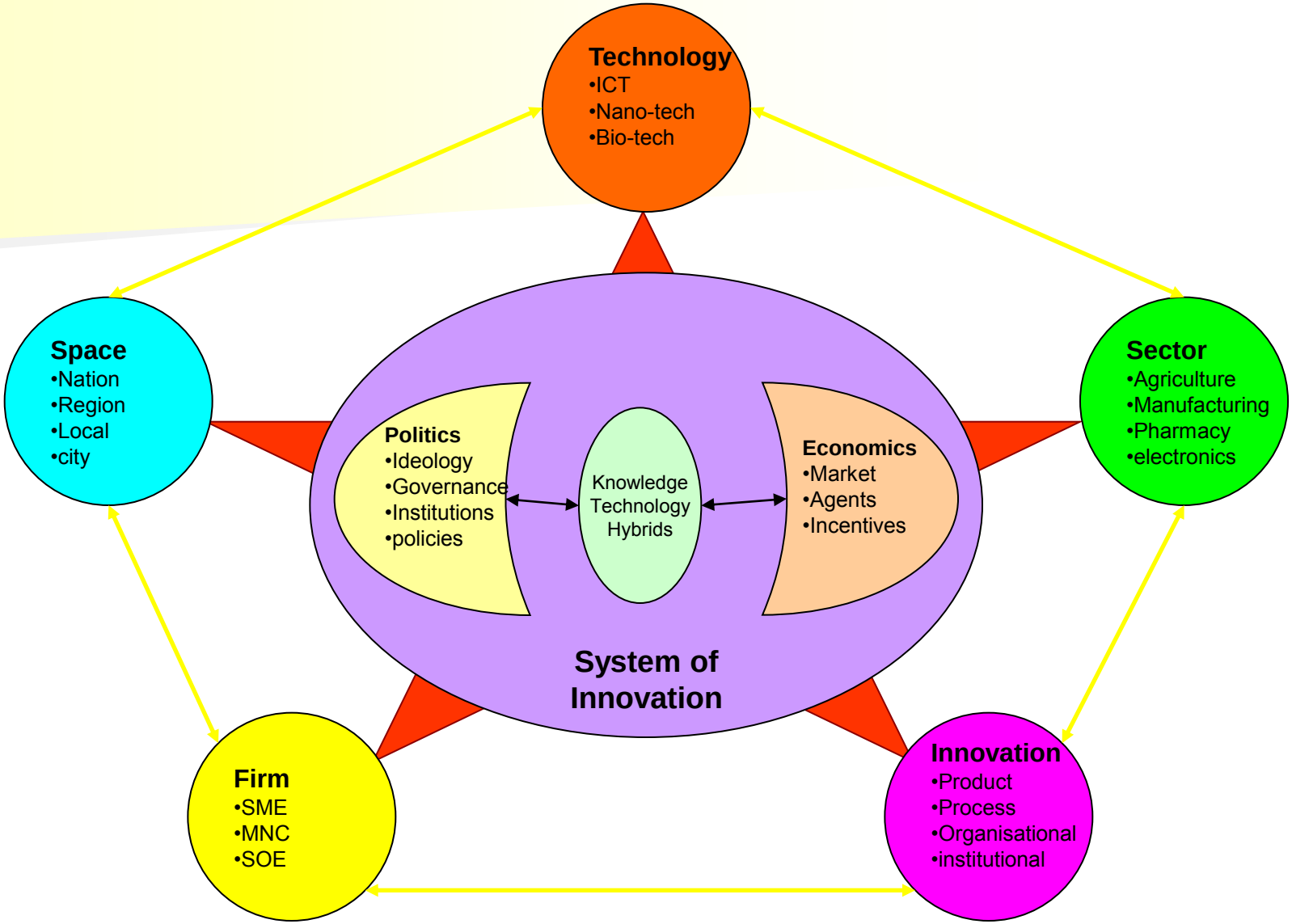
- What is needed is a strategy of co-evolution
- Where rural communities become modern
- Without necessarily becoming urban and industrial
- And all the services, education, health, energy, sanitation, clean water, transport and housing are upgraded by supporting the community system of innovation, equal to the support of innovation systems at the national, regional, sectoral or technology levels.
- By spreading the community system of innovation for broad based innovation for grassroots transformative livelihood changes from community ill-being into community comprehensive well-being.

Co-evolution

- We may have to question elite expectaion of progress from rural and agricultural to manufacturing and industrial transformation as it took place in the West and even the NICs
- Supplant transformative linear stages of progress with the transformative strategy and policy of co-evolution of communities with urban and maufacturing areas in African countries
- Ubuntu, solidarity, sharing , trust and social capital for co-evolution must be cultivated and promoted
- By promoting as a 'brand' or 'logo' what is framed as the "Community System of Innovation"

Priorities

- Priorities for the CIS are: rural services: health, agriculture, education, water, energy, transport and infrastructure
- Identifying through top researchers and research university work, local knowledge that can be turned into innovation
- This requires adding to the triple helicies an equal even if not even more significant or relevant component-communities as one of the pillars of the helicies
- And generating opportunities for wealth creation by deploying all the actors, activities and instituitions to support CIS


Technology
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•Incentives
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Innovation
Firm
•SME
•MNC
•SOE
Innovation
•Product
•Process
•Organisational
•institutional

Knowledge indicators

- If we go for CIS and the African NSI
- We need to develop synthetic innovation indicators
- "Not everything that can be counted counts and not everything that counts can be counted"(Albert Einstein)
- This is what seems to apply for the moment to Africa.

Concluding Remark: recommended key policy re-orienation

- Like the African NSI, the African CIS is still waiting to be made;
- There is a need to launch a broader CIS movement in Africa
- Co-evolution of rural and urban, agricultural and industrial sectors
- Modernise rural areas in partnership with manufacture , not in opposition
- From the Triple helicies we add the community and forge a quadra-helicies of (Government, universities, industry and the community) and plan policy, resources, research to support CIS
- Making the African NSI is… in itself a big social innovation,
- Work on both fronts: Community level innovative surge and wider African level system of innovation
- Africa selects the path of 'smart' co-evolutionary growth rather than linear and catch up which has been frustrating to date.

Thank You!!!

Mammo Muchie